SERVICE MANUAL ST333/ST333L

marantz®

model ST333/ST333L

Stereophonic Tuner

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32 Cross Street
Brookvale, N.S.W. 2100
Australia
Telex: 24121

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

In case of difficulties, do not hesitate to contact the Technical Department at abovementioned address.

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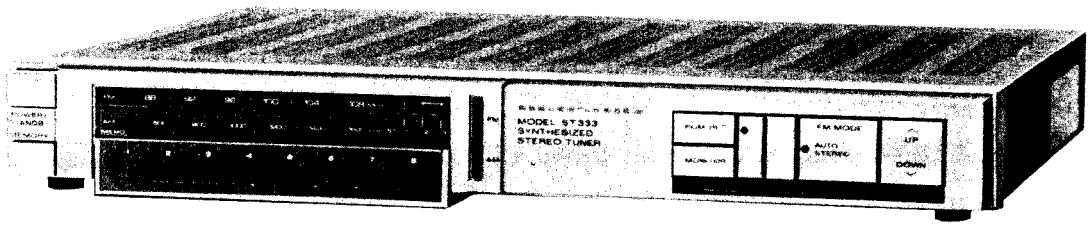
MODEL ST333/ST333L STEREOPHONIC TUNER



INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for the Marantz Model ST333/ST333L Stereophonic Tuner.

Servicing information and voltage data included in this manual are intended for use by knowledgeable and experienced personnel only. All instructions should be read carefully. No attempt should be made to proceed without a good understanding of circuitry operation.

The parts list furnishes complete ordering information. Most replacement parts should be ordered from the Marantz Company. However, a simple description is included for parts which can be obtained locally.

1. SHOCK, FIRE HAZARD SERVICE TEST

CAUTION: After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verfied before return to user/customer.

Ref. UL Standard No. 1270. Para. 66. 3. D (Mandatory Test after servicing Electrical Appliances, effective 7-1-83).

2. P.W. BOARDS

As can be seen from the circuit diagram the chassis of Model ST333/ST333L consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1. Tuner . . . . . mounted on P.W. Board P100
2. Antenna Terminal . . . . . mounted on P.W. Board PC00
3. Preset Key Switch . . . . . mounted on P.W. Board PS00
4. Up-Down Key Switch . . mounted on P.W. Board PT00
5. Power Switch . . . . . mounted on P.W. Board PU00
6. Input-Output Terminal . mounted on P.W. Board PV00

3. TEST EQUIPMENT REQUIRED FOR SERVICING

Item	Use
AM Signal Generator	Signal source for AM alignment
Test Loop	Use with AM signal generator
FM Signal Generator	Signal source for FM alignment
MPX Signal Generator	Stereo separation alignment and trouble shooting
Distortion Analyzer	Distortion measurements
Audio Oscillator	Sinewave and squarewave signal source
AC VTVM	Voltage measurements (AC)
Oscilloscope	Waveform analysis and trouble shooting and ASO alignment
Frequency Counter	MPX oscillator adjustment (VCO)
Circuit Tester	Trouble shooting
DC VTVM	Voltage measurements (DC)
AC Wattmeter	Monitors primary power to tuner
Line Voltmeter	Monitors potential of primary power to tuner
Variable Autotransformer (0 ~ 140V AC, 10A)	Adjusts level of primary power to tuner

4. TUNER ALIGNMENT PROCEDURES

A dummy resistor of 47 kohms must be connected across the tuner output terminals before alignment.

4.1 FM Alignment Procedures (Function switch in the "FM" position, MODE switch in the MONO position.)

1. FM RF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	FM signal generator to FM antenna terminal (300Ω) through matching network Set the SG RF output level so that some noise can be observed on the upper and lower side of the output waveform.	98.00 MHz	VTVM to L or R chnnel output (JV01)	98.00 MHz	FRONT END IFT (L6) for maximum output and minimum distortion.
2	FM signal generator 1 mV output to FM antenna terminal (300Ω) through matching network Modulation Level DIN 40 kHz DEV. IHF 75 kHz DEV.	98.00 MHz	"O" center meter or DC current meter in 100 μA range between (J201, J202)	98.00 MHz	L201 (Primary) core so that the meter indicates its center or may read "O".
3	FM signal generator 1 mV output to FM antenna terminal (300Ω) through matching network.	98.00 MHz	Distortion meter to L or R channel output (JV01)	98.00 MHz	L202 (Secondary) core for minimum distortion.

4.2 Muting Level Alignment (Function switch in the "FM" position, MODE switch in the "AUTO STEREO" position.)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	FM signal generator 12.5 μV output to FM antenna terminal through matching network (300 ohm, balanced)	98.00 MHz	VTVM to L or R channel output (JV01)	98.00 MHz	Adjust R222 until output is developed.

4.3 Multiplex Alignment Procedures (Function switch in the "FM" position, MODE switch in the "AUTO STEREO" position.)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	FM signal generator 1 mV output modulated by MPX signal generator to FM antenna terminal (300Ω) through matching network Modulation Level DIN 40 kHz+8% Pilot DEV. IHF 67.5 kHz+9% Pilot DEV.	No modulation	Frequency counter to (J301)	98.00 MHz	R304 so that Frequency may precisely read 19,000 kHz.
2		Stereo left (1,000 Hz)	VTVM to right channel output (JV01 Rch)		R310 for same separation in both channels.
3		Stereo right (1,000 Hz)	VTVM to left channel output (JV01 Lch)		
4	Repeat steps 2 and 3.				

4.4 AM Alignment Procedures (Function switch in the "AM" position.)

1. AM IF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	Sweep generator to AM Antenna Terminal.	450 kHz marker	Oscilloscope to (J203)	Quiet point on band	LA05 for maximum and symmetric response.

2. AM Local Oscillator Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1			DC voltmeter in 3V range to (J501, J502)	522 kHz (520 kHz)	LA03 for the following voltages.

3. AM RF Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	Apply the signal to the AM loop antenna from the AM signal generator using the test loop.	603 kHz	VTVM to L or R channel output (JV01)	603 kHz (600 kHz)	LA01 for maximum output.
2		1,404 kHz		1,404 kHz (1,400 kHz)	CA02 for maximum output.
3	Repeat steps 1 and 2.				

4. AM RF Alignment (ST333L Only)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	Apply the signal to the AM loop antenna from the AM signal generator using the test loop.	603 kHz (600 kHz)	VTVM to L or R channel output (J103, J104)	603 kHz (600 kHz)	LA01 for maximum output.
2		1,404 kHz (1,400 kHz)		1,404 kHz (1,400 kHz)	CA17-1 for maximum output.
3	Repeat steps 1 and 2.				

5. LW Local Oscillator Alignment (Function switch in the "LW" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1			DC voltmeter in 12V range to (J501, J502)	153 kHz	LA05 for 1.5V.

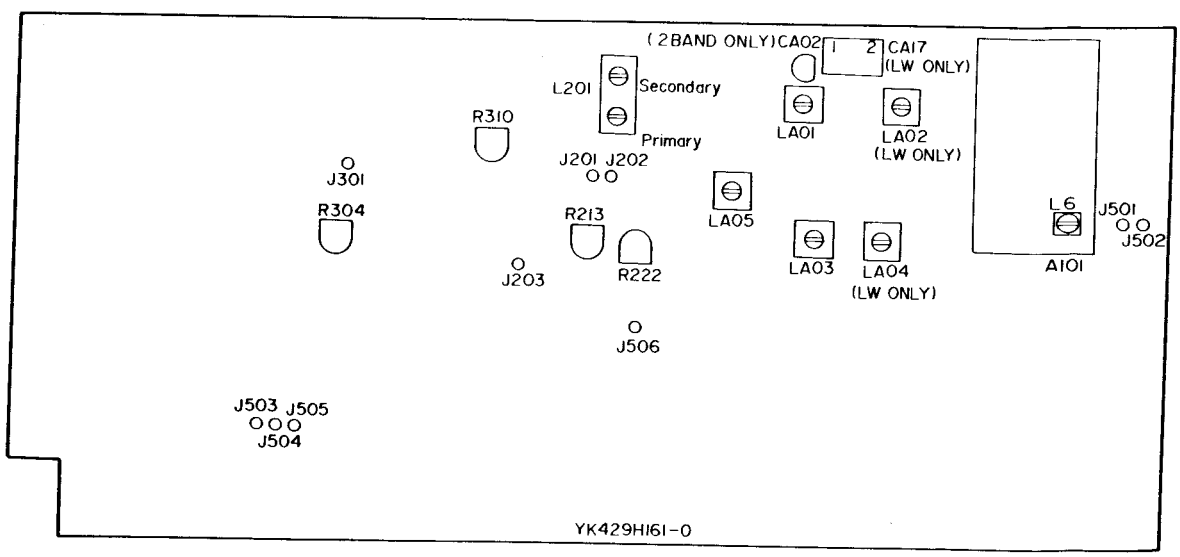
6. LW RF Alignment (Function switch in the "LW" position)

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	Apply the signal to the AM loop antenna from the RF generator using the test loop.	344 kHz	VTVM to L or R channel output (JV01)	344 kHz	CA17-2 for maximum output.
2		174 kHz		173 kHz	LA02 for maximum output.
3	Repeat steps 1 and 2 as necessary to obtain maximum sensitivity.				

AM AUTO SCAN STOP LEVEL Alignment

Step	Signal Source Connection	Signal Frequency	Indicator Connection	Set the Digital Readout Frequency	Adjust:
1	Apply the signal to the AM loop antenna from the AM signal generator using the test loop.	999 kHz (1,000 kHz)	DC voltmeter in 3V range to (J506)	999 kHz (1,000 kHz)	Adjust R213 to a point where voltmeter indication changes from low (0V) to high (approx. 5V) level.

5. TEST POINTS AND ALIGNMENT POINTS



6. μPD1704C-544 (Q501)

1. SINGLE-CHIP MICROPROCESSOR CONTAINING PLL FREQUENCY SYNTHESIZER FOR μPD1704C-544 (Q501) AM/FM TUNER

- **Absolute Maximum Ratings**

Item	Symbol	Ratings	Unit
Supply voltage	V_{DD}	−0.3 ~ +6.0	V
Input voltage	V_I	−0.3 ~ +V_{DD}	V
Output voltage	V_O	−0.3 ~ +V_{DD}	V
Output absorption current	I_O	10	mA
Operating temperature	T_{opt}	−35 ~ +75	°C
Storage temperature	T_{stg}	−55 ~ +125	°C
Output withstand voltage	V_{BDS}	Across Sa and Sg terminals (voltage across drain and source)	V

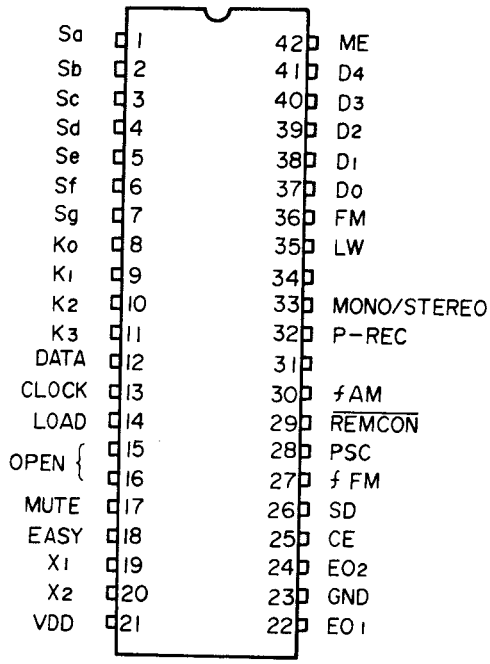
- **Recommended Operation Range**

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	V_{DD}		4.5	5.0	5.5	V
Data (RAM) holding voltage	V_{RAM}	CE=0, CLOCK STOP instruction execution	3.0		5.5	V
Oscillation stop supply voltage	V_{DDS}			3.2	3.8	V
Output withstand voltage	V_{BDS}	Across Sa and Sg terminals (voltage across drain and source) I_{OH}=−5 μA			−30	V
Rise time of supply voltage	T_{rise}	V_{DD}=0 → 4.5V			500	ms

- **Electrical Charateristics** (V_{DD} = +4.5 ~ +5.5V, Ta = −35 ~ +75°C)

Item	Symbol	Condition		Min.	Typ.	Max.	Unit
High-level input voltage	V_{IH1}	SD, INT terminal		0.8V_{DD}		V_{DD}	V
High-level input voltage	V_{IH2}	I/O port, CE terminal		0.7V_{DD}		V_{DD}	V
High-level input voltage	V_{IH3}	K_0 ~ K_3 terminal		0.6V_{DD}		V_{DD}	V
Low-level input voltage	V_{IL1}	I/O port, CE terminal		0		0.3V_{DD}	V
Low-level input voltage	V_{IL2}	K_0 ~ K_3, SD, INT terminal		0		0.2V_{DD}	V
High-level output voltage	V_{OH1}	EO_1, EO_2 terminal	I_{OH}=−0.5mA	4.0			V
High-level output voltage	V_{OH2}	D_1 ~ D_6, MT/D_7, I/O port	I_{OH}=−0.2mA	4.0			V
High-level output voltage	V_{OH3}	PSC terminal	I_{OH}=−0.1mA	4.0			V
High-level output voltage	V_{OH4}	Sa ~ Sg terminal	I_{OH}=−0.5mA	3.0			V
Low-level output voltage	V_{OL1}	EO_1, ED_2 terminal, I/O port	I_{OL}=0.5mA			0.5	V
Low-level output voltage	V_{OL2}	D_1 ~ D_6, MT/D_7, PSC terminal	I_{OL}=0.2mA			0.5	V
High-level input current	$+I_{IH1}$	K_0 ~ K_3 terminal	V_{IN}=V_{DD}=5.0V	25	50	100	μA
High-level input current	$+I_{IH2}$	X_1 terminal (in pull down)	V_{IN}=V_{DD}=5.0V		300		μA
Low-level input current	$-I_{IL1}$	AM, FM terminal (in pull up)	V_{IN}=0, V_{DD}=5.0V		300		μA
Output leak current	I_L	EO_1, EO_2 terminal,	Ta=25°C		10^{-3}	1	μA
Response frequency	f_{AM}	AM terminal, V_{in}=1.0 Vp-p (MIN.), DC cut		0.5		2.5	MHz
Response frequency	f_{FM}	FM terminal, V_{in}=0.8 Vp-p (MIN.), DC cut		0.5		8.8	MHz
Operating current	I_{DD1}	Excluding I/O current from I/O terminals			3		mA
Data (RAM) holding current	I_{DD2}	CE=0, CKSTP instruction execution, Ta=25°C, V_{DD}=5.0V				10	μA

- **Pin Connections**



- **Functions of Terminal**

Pin No.	Symbol	Name	Function
1 ~ 7	Sa to Sg	Segment output	Key return signal source terminal, active at the high level.
8 ~ 11	$K_0 \sim K_3$	Key return signal input	Key return signal input terminal from the remote key matrix.
12 ~ 14	DATA CLOCK LOAD		Display data output terminal to preset station LED display drivers Q504, Q505.
17	MUTE	Mute	Muting output terminal to kill shocks and noise that are caused when PLL is out of lock.
18	EASY		The high level is outputted for about 100 ms when the band, up/down and preset memory keys are depressed (output terminal for easy operation).
19, 20	X_1, X_2	X'tal	Quartz crystal oscillator connection terminal (4.5 MHz).
21	V_{DD}	V_{DD}	Device power terminal.
22	EO_1	Error output	Phase detector charge pump output.
23	GND	Ground	Connected to the system ground.
25	CE	Chip enable	Low level in back-up, high level with the device operated in standard form.
26	SD	Station detector	Inputs auto tuning stop signal.
27	f_{FM}	FM local oscillator signal inputs	Inputs output (1/16, 1/17) into which FM local oscillator output is divided by prescaler Q502.
28	PSC	Prescaler control	Outputs division ratio change-over signal to the prescaler when the pulse swarrow method is used for division.
29	$\overline{\text{REMCON}}$		Remote-control input terminal, active at the low level.
30	f_{AM}	AM local oscillator signal inputs	Inputs MW/LW local oscillator output.
32	P-REC		High level in preset record enable mode.
33	MONO/ STEREO		The FM band is in either MONO or STEREO mode. High level in STEREO mode.
35	LW		Outputs the high level when the LW band is currently received.
36	FM		Outputs the high level when the FM band is currently received.
37 ~ 41	$D_0 \sim D_4$		Display data output terminal to dot display driver UPD6322C.
42	ME		Outputs the high level in memory enable mode.

7. OUTLINE OF FUNCTIONS

- **Receiving Band**

Three bands of FM, MW and LW can be received in Europe, and two bands of FM and AM in Japan and the U.S.A.

Destination	Type of Band	Receiving Frequency Range	Channel Space	Reference Frequency	Intermediate Frequency
Europe	MW	522 ~ 1611 kHz	9 kHz	9 kHz	450 kHz
	LW	153 ~ 353 kHz	1 kHz	1 kHz	450 kHz
	FM	87.50 ~ 108.00 MHz	50 kHz	10 kHz	10.7 MHz
U.S.A.	AM	520 ~ 1610 kHz	10 kHz	10 kHz	450 kHz
	FM	87.5 ~ 108.0 MHz	100 kHz	10 kHz	10.7 MHz
Japan	AM	522 ~ 1611 kHz	9 kHz	9 kHz	450 kHz
	FM	76.0 ~ 90.0 MHz	100 kHz	10 kHz	10.7 MHz

- **Channel Selecting Function**

(1) Automatic Up/Down Tuning (sawtooth wave mode)
A channel is selected at a speed of approx. 60 ms/step until high-level input is developed at pin (26) of the SD terminal.

(2) Manual Up/Down Tuning (sawtooth wave mode)
Single-finger depression of the momentary switch allows stepwise forward, and continuous depression for 0.5 second or longer runs the tape fast forward at approx. 60 ms/step.

(3) Preset Memory Access
FM ..... 8 channels, M1 ~ M8
LW/MW ... 8 channels, M1 ~ M8 in random access

- **Preset Memory Write**

A frequency being currently received is written by depressing the preset key while the ME lamp is lit.

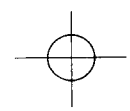
- **Programmable Preset Recording Function**

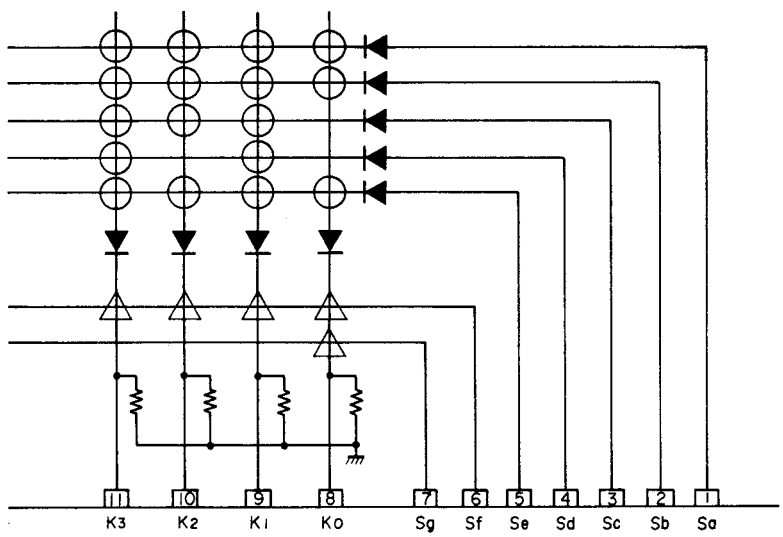
Programs can be reserved up to six channels in FM, MW and LW bands by the memory and preset keys while the PRG-REC lamp is lit.
Whenever the chip enable signal changes from high to low level during operation of the PRG-REC lamp, a channel is accessed in the order of reservation. Reserved channels are displayed every second when the MONITOR key is depressed in that state.

- **Remote Control Function**

The following actions are allowed by remote control.
(1) Preset memory access
(2) Band change-over
(3) Manual/automatic up/down channel selection

8. CONFIGURATION OF KEY MATRIX

	K_3	K_2	K_1	K_0	Type of Key
Sa	M1	M2	M3	M4	Momentary switch 
Sb	M5	M6	M7	M8	
Sc	UP	DOWN	MEMO		
Sd	P-REC		MONI		
Se	MW (AM)	FM	LW	MONO/ST	
Sf	BAND 2	BAND 1	1K/9K	N/N+2	Initialize diode matrix
Sg				LW	



9. DESCRIPTION OF KEY MATRIX

- **Momentary Key**

(1) M1 ~ M8
Preset, memory write, access and preset recording program reservation keys.

(a) Write (in any mode other than P-REC)
When any one of the M1 ~ M8 keys is depressed within about 5 seconds after depression of the MEMO key (while the ME lamp is lit), a frequency currently received and MONO/STEREO (only in FM) are stored in a location of the memory corresponding to the depressed key.

(b) Access
When any one of the M1 ~ M8 keys is depressed, contents (frequency, MONO/STEREO) in a location

of the memory corresponding to the depressed key are accessed. Eight FM channels can be accessed while 8 MW/LW channels can be accessed at random.

(c) Preset recording program reservation
A program can be reserved by depressing any one of the M1 ~ M8 keys within about 5 seconds after depression of the MEMO key in P-REC mode.
Programs can be reserved up to six channels in FM, MW and LW bands at random. An ordinary access to the memory is taken unless the ME lamp is lit even in P-REC mode.

(2) MEMO
The key shows preset memory write mode or preset recording program reservation enable mode. When the key is depressed, the ME lamp is lit for about 5 seconds and enable mode is set.

(3) UP/DOWN
Automatic/manual channel selection key (sawtooth wave mode).

(a) Manual
Frequency is stepped up or down (channel step) whenever the key is depressed. Continuous depression of these keys for about 0.5 second or longer allows continuous forward of the tape at about 60 ms/step.

(b) Automatic
When the key is released with continuous forward run in manual mode, frequency is automatically stepped up or down. Scanning is stopped when the high level is inputted to the SD (station detector) terminal or when these keys are redepressed.

(4) P-REC
The P-REC lamp comes on with the key depressed to display preset record enable mode. Redepression of the key clears the same mode. The UP/DOWN key does not function in P-REC mode.

(5) MONITOR
The key operates only in P-REC mode. When the key is depressed, the contents of reserved programs are displayed every second and the tape stops in the last.

(6) FM, MW (AM) and LW
When any one of these keys is depressed, a last channel of a band corresponding to the depressed key is accessed. However, the LW key is ignored if LW null is selected on the diode matrix.

(7) MONO/STEREO
Either MONO or STEREO mode is cyclically set with the key depressed. MONO/STEREO can be preset to the memory.

10. FREQUENCY DISPLAY

Receiving frequency is displayed by 18 dots (18-dot LED array, D001).

	For F		For N and U				For LW
DOT	FM (MHz)	AM (kHz)	FM (MHz)		AM (MW)		LW (kHz)
			50 kHz STEP	100 kHz STEP	9 kHz STEP	10 kHz STEP	
1	76.0 ~ 76.7	522 ~ 576	87.50 ~ 88.65	87.5 ~ 88.6	522 ~ 576	520 ~ 570	153 ~ 163
2	76.8 ~ 77.5	585 ~ 639	88.70 ~ 89.85	88.7 ~ 89.8	585 ~ 639	580 ~ 630	164 ~ 174
3	77.6 ~ 78.3	648 ~ 702	89.90 ~ 91.05	89.9 ~ 91.0	648 ~ 702	640 ~ 690	175 ~ 185
4	78.4 ~ 79.1	711 ~ 765	91.10 ~ 92.25	91.1 ~ 92.2	711 ~ 765	700 ~ 750	186 ~ 196
5	79.2 ~ 79.9	774 ~ 828	92.30 ~ 93.45	92.3 ~ 93.4	774 ~ 828	760 ~ 810	197 ~ 207
6	80.0 ~ 80.7	837 ~ 891	93.50 ~ 94.65	93.5 ~ 94.6	837 ~ 891	820 ~ 870	208 ~ 218
7	80.8 ~ 81.5	900 ~ 954	94.70 ~ 95.85	94.7 ~ 95.8	900 ~ 954	880 ~ 930	219 ~ 229
8	81.6 ~ 82.3	963 ~ 1017	95.90 ~ 97.05	95.9 ~ 97.0	963 ~ 1017	940 ~ 990	230 ~ 240
9	82.4 ~ 83.1	1026 ~ 1080	97.10 ~ 98.25	97.1 ~ 98.2	1026 ~ 1080	1000 ~ 1050	241 ~ 251
10	83.2 ~ 83.9	1089 ~ 1143	98.30 ~ 99.45	98.3 ~ 99.4	1089 ~ 1143	1060 ~ 1110	252 ~ 262
11	84.0 ~ 84.7	1152 ~ 1206	99.50 ~ 100.65	99.5 ~ 100.6	1152 ~ 1206	1120 ~ 1170	263 ~ 273
12	84.8 ~ 85.5	1215 ~ 1269	100.70 ~ 101.85	100.7 ~ 101.8	1215 ~ 1269	1180 ~ 1230	274 ~ 284
13	85.6 ~ 86.3	1278 ~ 1332	101.90 ~ 103.05	101.9 ~ 103.0	1278 ~ 1332	1240 ~ 1290	285 ~ 295
14	86.4 ~ 87.1	1341 ~ 1395	103.10 ~ 104.25	103.1 ~ 104.2	1341 ~ 1395	1300 ~ 1350	296 ~ 306
15	87.2 ~ 87.9	1404 ~ 1458	104.30 ~ 105.45	104.3 ~ 105.4	1404 ~ 1458	1360 ~ 1410	307 ~ 317
16	88.0 ~ 88.7	1467 ~ 1521	105.50 ~ 106.65	105.5 ~ 106.6	1467 ~ 1521	1420 ~ 1470	318 ~ 328
17	88.8 ~ 89.5	1530 ~ 1584	106.70 ~ 107.85	106.7 ~ 107.8	1530 ~ 1584	1480 ~ 1530	329 ~ 339
18	89.6 ~ 90.0	1593 ~ 1611	107.90 ~ 108.00	107.9 ~ 108.0	1593 ~ 1611	1540 ~ 1610	340 ~ 353

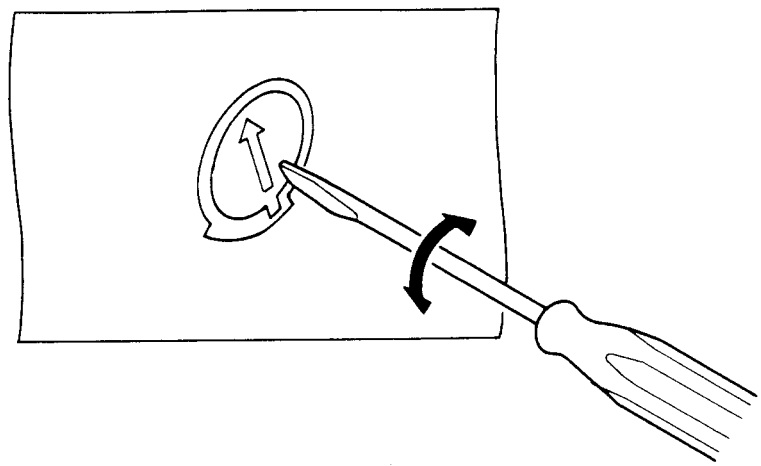
11. VOLTAGE CONVERSION

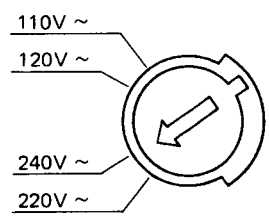
- **EUROPEAN MODEL ONLY**

To convert the unit to a different power source voltage, change the position as illustrated in the drawing below.

CAUTION
DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.

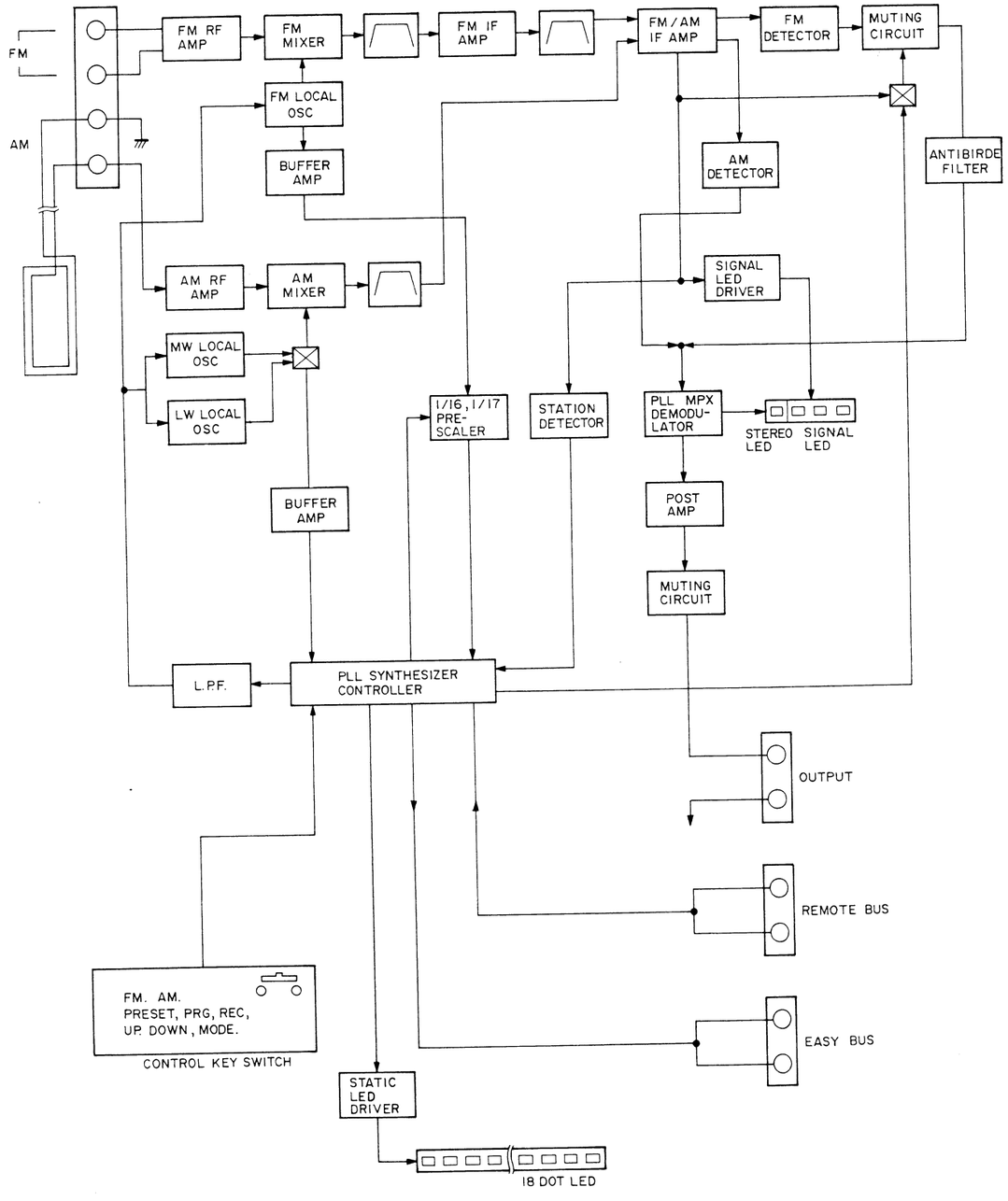
Voltage Conversion Chart





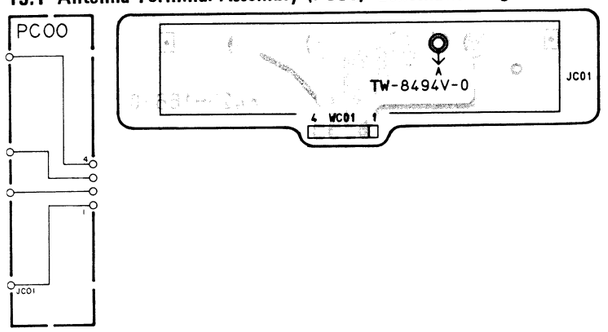
Note on safety: Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠ . Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

12. BLOCK DIAGRAM

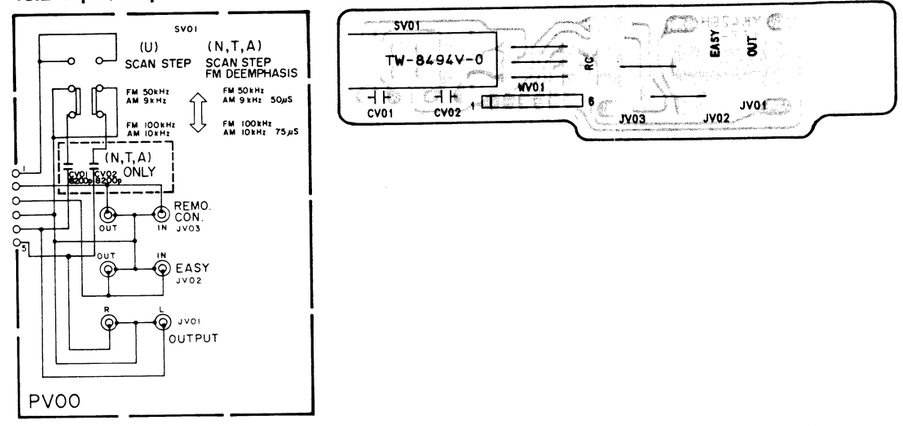


13. DIAGRAM AND COMPONENT LOCATIONS

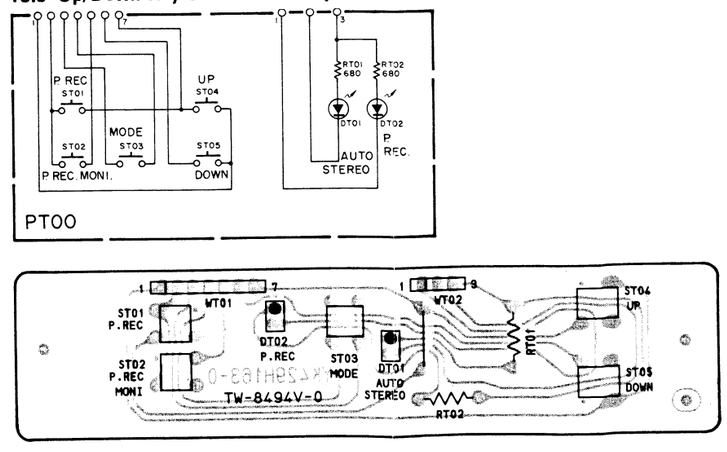
13.1 Antenna Terminal Assembly (PC00) Schematic Diagram and Component Locations



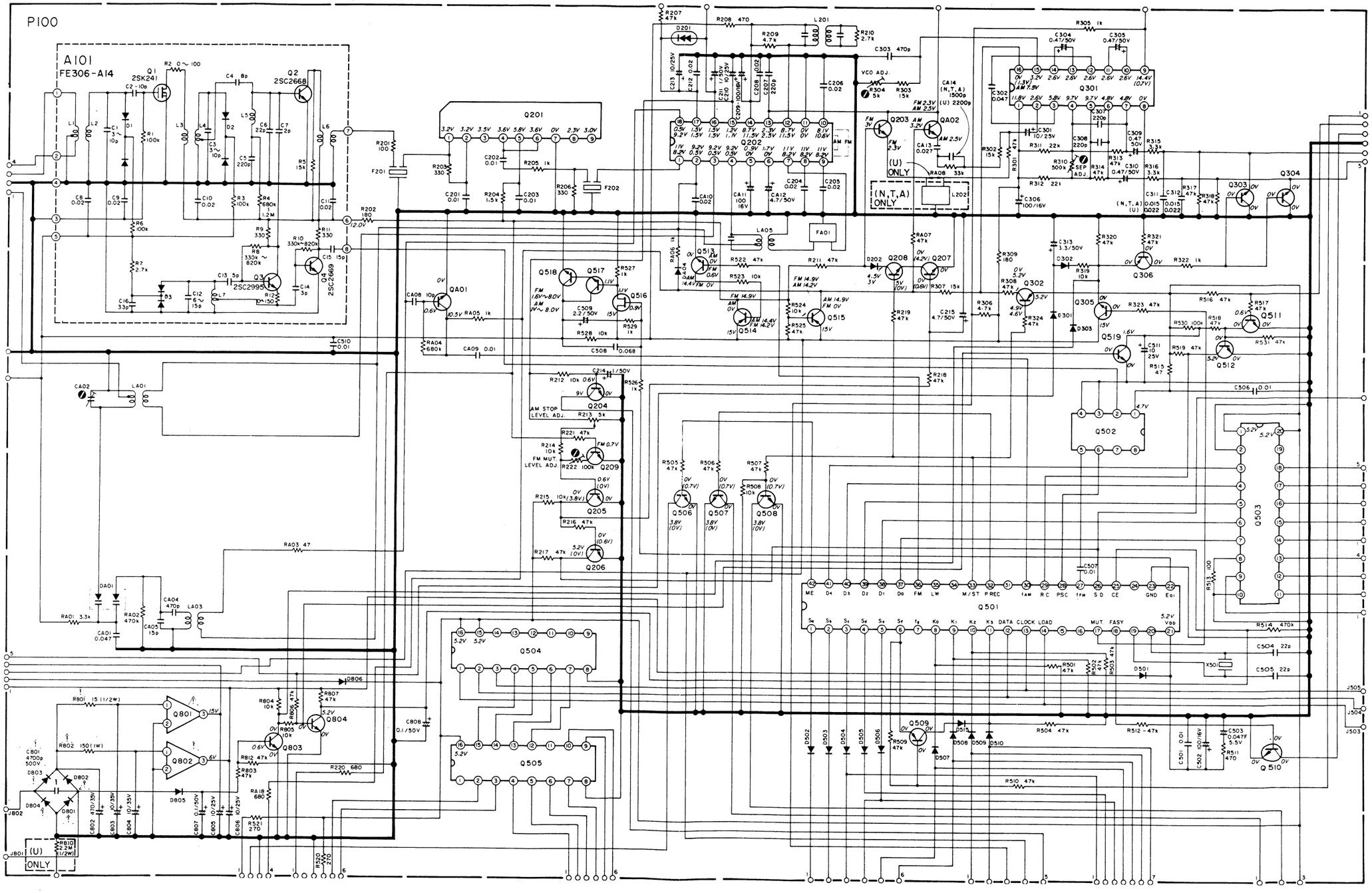
13.2 Input/Output Terminal Assembly (PV00) Schematic Diagram and Component Locations

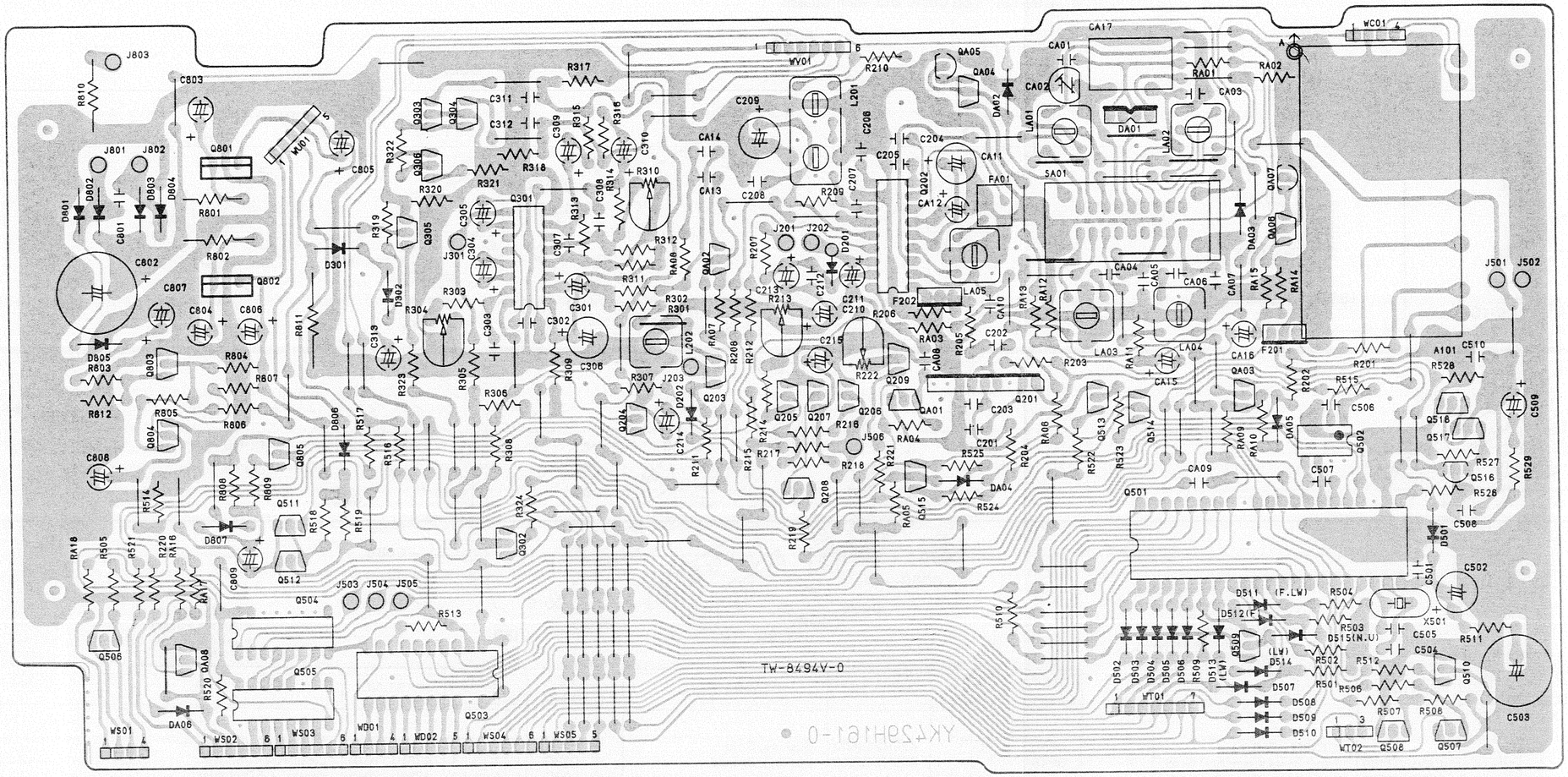


13.3 Up/Down Key Switch Assembly (PT00) Schematic Diagram and Component Locations

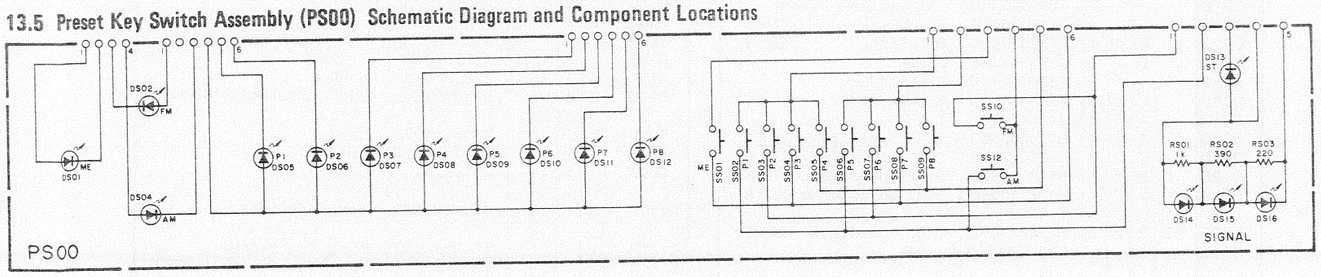


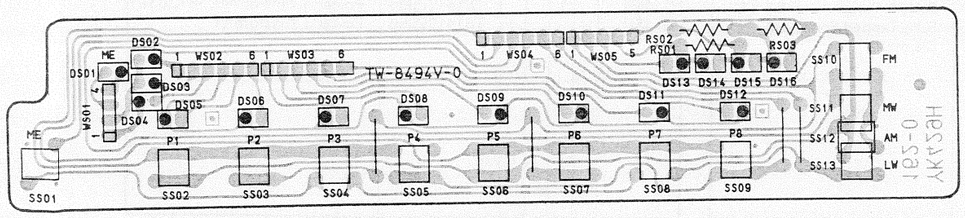
13.4 Tuner Assembly (P100) Schematic Diagram and Component Locations



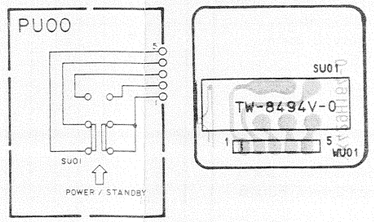


13.5 Preset Key Switch Assembly (PS00) Schematic Diagram and Component Locations



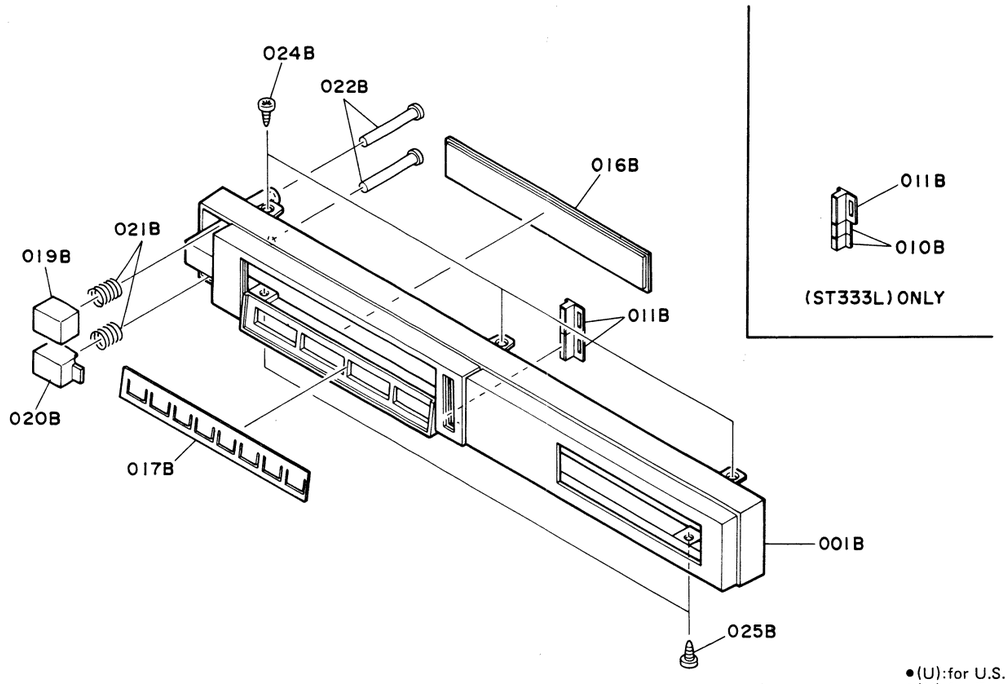


13.6 Power Switch Assembly (PU00) Schematic Diagram and Component Locations



14. EXPLODED VIEW AND PARTS LIST

● [C01-99] Front Panel

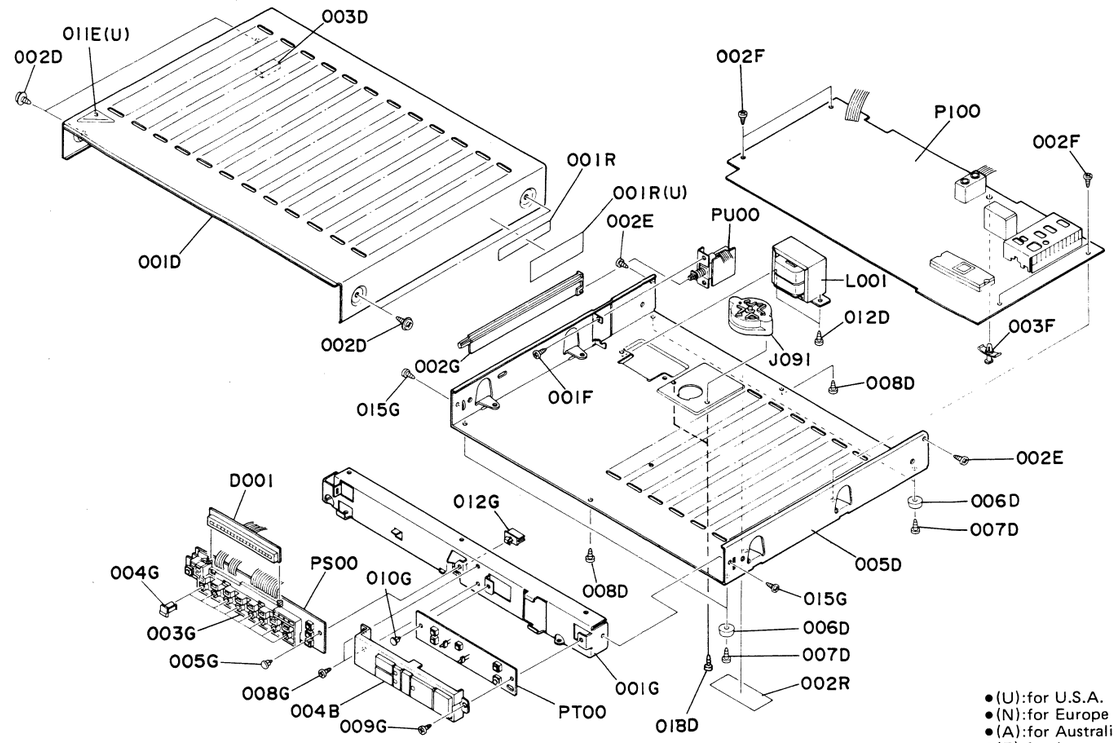


●(U):for U.S.A.
●(N):for Europe
●(A):for Australia
●(F):for Japan

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
						(ST333, ONLY)
A	1	1	1		429H063400	Front Panel Assembly, Gold
A1				1	429H063410	Front Panel Assembly, Gold
A2				1	429H063420	Front Panel Assembly, Bronze
001B	1	1	1	1	429H063010	Escutcheon, Front Panel; (G)
001B				1	429H063110	Escutcheon, Front Panel; (B)
016B	1	1	1		429H158010	Window
016B				1	429H158020	Window
017B	1	1	1	1	429H127010	Control Board
019B	1	1	1	1	139T154350	Knob, Power/Standby; Gold
019B				1	139T154250	Knob, Power/Standby; Bronze
020B	1	1	1	1	429H154050	Knob, Memory; Gold
020B				1	429H154150	Knob, Memory; Bronze
021B	2	2	2	2	139T115030	Spring
022B	2	2	2	2	139T254010	Pin
011B	2	2	2	2	429H154060	Knob, FM-AM
024B	2	2	2	2	5150306B0	F.H. Tapped Screw F3 x 6
025B	2	2	2	2	5150306B0	F.H. Tapped Screw F3 x 6

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
						(ST333L, ONLY)
A		1			430H063400	Front Panel Assembly, Gold
001B		1			430H063010	Escutcheon, Front Panel; (G)
016B		1			430H158010	Window
017B		1			429H127010	Control Board
019B		1			139H154350	Knob, Power/Standby
020B		1			429H154050	Knob, Memory
021B		2			139H115030	Spring
022B		2			139H254010	Pin
010B		2			430H154110	Knob, MW-LW
011B		1			429H154060	Knob, FM
024B		2			51500306B0	F.H. Tapped Screw F3 x 6
025B		2			51500306B0	F.H. Tapped Screw F3 x 6

● [C02-99] Top Cover and Main Chassis

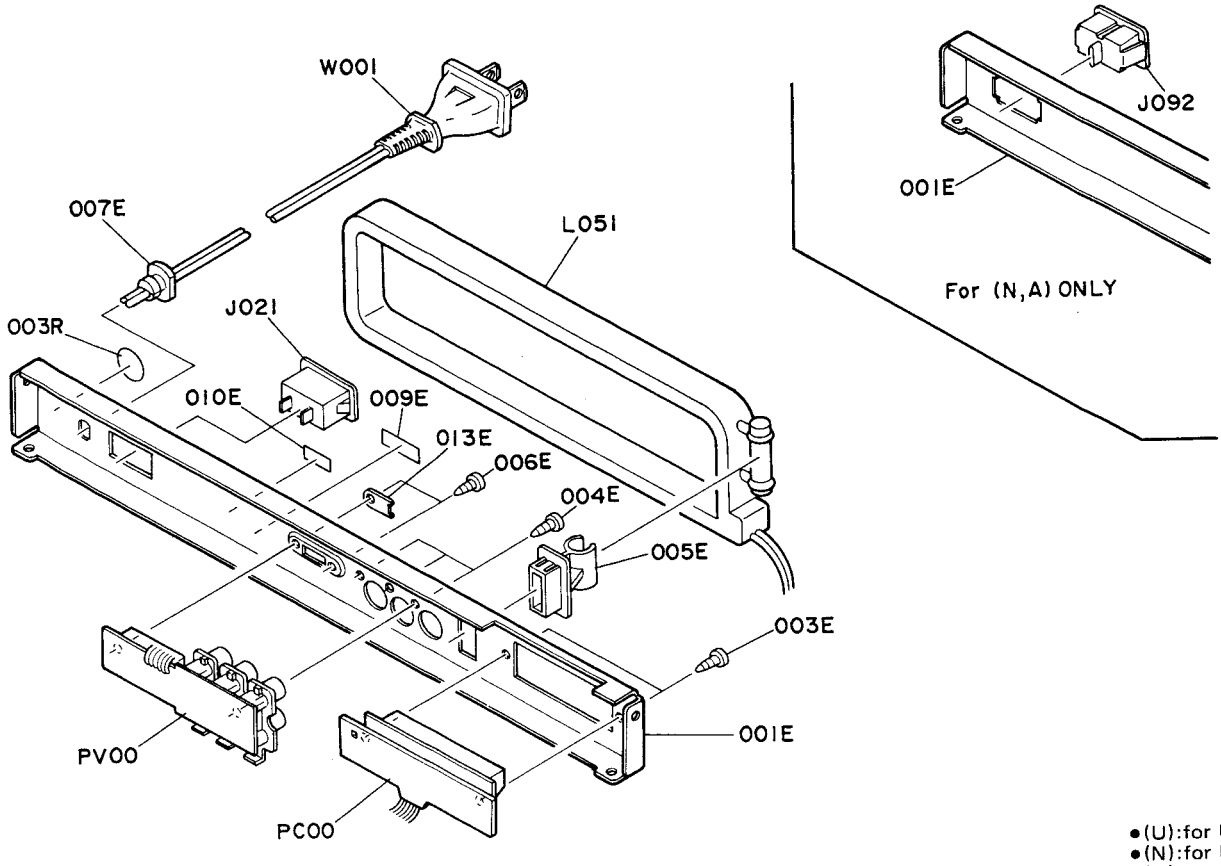


●(U):for U.S.A.
●(N):for Europe
●(A):for Australia
●(F):for Japan

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
004B	1	1	1	1	429H259500	Bushing, Gold
004B				1	429H259510	Bushing, Bronze
001D	1	1	1	1	429H257010	Lid, Top Cover; Gold
001D				1	429H257110	Lid, Top Cover; Bronze
002D	4				51260306Z0	B.T. Screw B3 x 6
002D		4	4	4	51260306U0	B.T. Screw B3 x 6
003D	1	1	1	1	429H118040	Spacer
005D	1			1	429H105010	Chassis, Main
005D		1	1		429H105110	Chassis, Main
006D	4	4	4	4	240H057010	Leg
007D	4	4	4	4	51280306B0	B.H. Tapped Screw B3 x 6
008D	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
012D	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
013D		2	2		51280306B0	B.H. Tapped Screw B3 x 6
002E	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
011E	1				105H861010	Label
001F	1	1	1	1	51100306A9	B.H.M. Screw B3 x 6
002F	4	4	4	4	51280306B0	B.H. Tapped Screw B3 x 6
003F	1	1	1	1	429H005010	Clamper

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
001G	1	1	1	1	429H160010	Bracket, Front Chassis
002G	1	1	1	1	429H121010	Link, Power Switch
003G	1	1	1	1	429H118010	Spacer, LED Holder
004G	8	8	8	8	429H270010	Button
005G	1	1	1	1	2276005050	Clamper
008G	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
009G	1	1	1	1	51280306B0	B.H. Tapped Screw B3 x 6
010G	1	1	1	1	2276005050	Clamper
012G	1	1	1	1	2218271020	Holder
015G	2	2	2	2	51280306B0	B.H. Tapped Screw B3 x 6
001R	1				235H861020	Label
001R		1	1		2932861110	Label
002R		1	1		2578861010	Label
⚠J091		1	1		BY05060060	Voltage Selector
⚠L001	1				TS14132060	Power Transformer
⚠L001		1	1		TS14132070	Power Transformer, (ST333)
⚠L001		1			TS14132080	Power Transformer, (ST333L)
⚠L001				1	TS14132050	Power Transformer

● [C03-99] Rear Panel

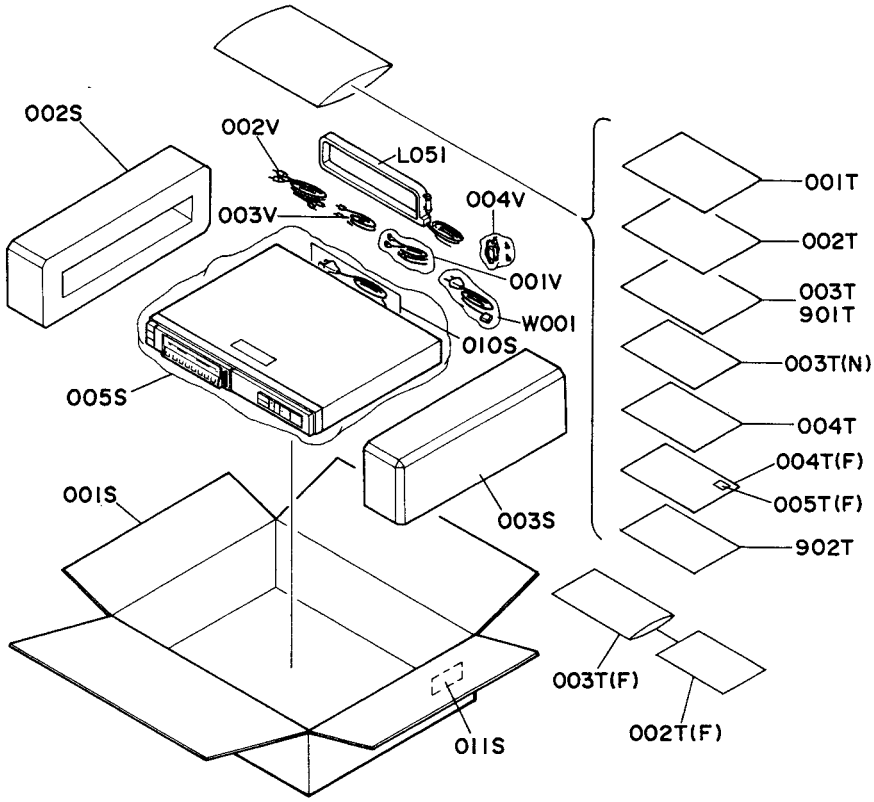


●(U):for U.S.A.
●(N):for Europe
●(A):for Australia
●(F):for Japan

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
001E	1				429H160240	Bracket, Rear Panel
001E		1	1		429H160220	Bracket, Rear Panel
001E				1	429H160210	Bracket, Rear Panel
003E	2	2	2	2	5128306B0	B.H. Tapped Screw B3 x 6
004E	3	3	3	3	5128306B0	B.H. Tapped Screw B3 x 6
005E	1	1	1	1	417H271020	Holder, Loop Antenna
006E	2	2	2		51102605A0	B.H.M. Screw B2.6 x 5
007E	1			1	1455259030	Bushing, AC Cord
009E	1	1	1	1	2112265010	Indicator
010E	1				2457861040	Label, CSA
010E		1	1		4581861010	Label, Made in Japan
013E	1	1	1		429H114010	Stopper, Scan

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
003R	1				9511101070	Label, UL
⚠ J021	1			1	YJ04000990	Jack, AC Outlet
⚠ J092		1	1		YP04000580	Plug, AC Inlet
L051	1	1	1	1	LA00035020	Loop Antenna
⚠ W001	1				YC01900070	A.C. Power Cord
⚠ W001				1	YC01800190	A.C. Power Cord

● [H01-99] Packing Materials



●(U):for U.S.A.
●(N):for Europe
●(A):for Australia
●(F):for Japan

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
001S	1				429H801010	Packing Case
001S		1	1	1	429H801020	Packing Case, (ST333)
001S		1			430H801020	Packing Case, (ST333L)
002S	1	1	1	1	429H809010	Cushion, (L)
003S	1	1	1	1	429H809020	Cushion, (R)
005S	1	1	1	1	9013540010	Polyethylene Bag
010S	1			1	2918107390	Sheet
011S	2				9526019010	Serial No. Card
011S		4			9526019060	Serial No. Card
011S			4		9526019030	Serial No. Card
011S				4	9526019040	Serial No. Card
001T	1				429H851210	Instructions
001T		1	1		429H851310	Instructions
001T				1	429H851110	Instructions
002T	1				429H851220	Instructions, Spec
002T		1	1		429H851320	Instructions, Spec
002T				1	9631000130	Guarantee Card
003T	1				103H854010	Guarantee Card
003T		1			429H856010	Circuit Diagram
003T			1		9631000090	Guarantee Card
003T				1	128T854010	Guarantee Card

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
004T	1				2225813010	Envelope
004T				1	9611000050	User's Card
005T				1	9540000010	License
001V	1	1	1	1	ZA02000070	EXT. Antenna
002V	1	1	1	1	ZD00400030	Connective Cord, Output
003V	1	1	1	1	ZD00400090	Connective Cord, Pin Cord
004V	1	1	1	1	429H271510	Holder. Loop Anttenna
901T	1				2818854040	Guarantee Card (Canada)
902T	1				9650000050	S.Station Card (Canada)
L051	1	1	1	1	LA00035020	Loop Antenna.
⚠W001		1			ZC01805010	A.C. Power Cord
⚠W001			1		ZC02006020	A.C. Power Cord

15. ELECTRICAL PARTS LIST

- (U):for U.S.A.
- (N):for Europe
- (A):for Australia
- (F):for Japan

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
						P100-TUNER CIRCUIT BOARD
P100	1	1	1	1	YK429H1610	P.W. Board, Tuner
	1				ZZ429H1610	P.W. Board Assembly
		1	1		ZZ429H8610	P.W. Board Assembly
						P100-CAPACITORS
A101	1	1	1		AV01202130	V.H.F. Tuner, FE306-A14
A101				1	AV01201050	V.H.F. Tuner, FE306-J14
CA01	1	1	1	1	DF15473310	Film 0.047μF ±5%
CA02	1	1	1	1	CT12000090	Trimming 16pF
CA03	1	1	1	1	DD15270370	Ceramic 27pF ±5%(ST333L)
CA04	1	1	1	1	DF15471550	Film 470pF ±5%
CA05	1	1	1	1	DD15150370	Ceramic 15pF ±5%
CA06		1			DD15151550	Ceramic 150pF ±5%(ST333L)
CA07		1			DD15560370	Ceramic 56pF ±5%(ST333L)
CA08	1	1	1	1	DD11100370	Ceramic 10pF ±0.5pF
CA09	1	1	1	1	DK18103310	Ceramic 0.01μF
CA10	1	1	1	1	DK18223310	Ceramic 0.022μF
CA11	1	1	1	1	EA10701630	Elect 100μF 16V
CA12	1	1	1	1	EA47505030	Elect 4.7μF 50V
CA13	1	1	1	1	DF15273310	Film 0.027μF ±5%
CA14	1				DF15222310	Film 2200pF ±5%
CA14		1	1	1	DF15152310	Film 1500pF ±5%
CA15		1			EA47505030	Elect 4.7μF 50V(ST333L)
CA16		1			EA47505030	Elect 4.7μF 50V(ST333L)
CA17		1			CT21600020	Trimming 4.7μF 50V (ST333L)
C201	1	1	1	1	DK18103310	Ceramic 0.01μF
C202	1	1	1	1	DK18103310	Ceramic 0.01μF
C203	1	1	1	1	DK18103310	Ceramic 0.01μF
C204	1	1	1	1	DK18223310	Ceramic 0.022μF
C205	1	1	1	1	DK18223310	Ceramic 0.022μF
C206	1	1	1	1	DK18223310	Ceramic 0.022μF
C207	1	1	1	1	DD15221370	Ceramic 220pF ±5%
C208	1	1	1	1	DK18223310	Ceramic 0.022μF
C209	1	1	1	1	EA10701630	Elect 100μF 16V
C210	1	1	1	1	EA10602530	Elect 10μF 25V
C211	1	1	1	1	EA10505030	Elect 1μF 50V
C212	1	1	1	1	DK18223310	Ceramic 0.022μF
C213	1	1	1	1	EA10602530	Elect 10μF 25V
C214	1	1	1	1	EA10505030	Elect 1μF 50V
C215	1	1	1	1	EA47505030	4.7μF 50V
C301	1	1	1	1	EA10602530	Elect 10μF 25V
C302	1	1	1	1	DF15473310	Film 0.047μF ±5%
C303	1	1	1	1	DF15471550	Film 470pF ±5%
C304	1	1	1	1	EA47405030	Elect 0.47μF 50V
C305	1	1	1	1	EA47405030	Elect 0.47μF 50V
C306	1	1	1	1	EA10701630	Elect 100μF 16V
C307	1	1	1	1	DD15221370	Ceramic 220pF ±5%
C308	1	1	1	1	DD15221370	Ceramic 220pF ±5%
C309	1	1	1	1	EA22505030	Elect 2.2μF 50V
C310	1	1	1	1	EA22505030	Elect 2.2μF 50V
C311	1				DF15223310	Film 0.022μF ±5%
C311		1	1	1	DF15153310	Film 0.015μF ±5%
C312	1				DF15223310	Film 0.022μF ±5%
C312		1	1	1	DF15153310	Film 0.015μF ±5%
C313	1	1	1	1	EA33505030	Elect 3.3μF 50V

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
C501	1	1	1	1	DK18103310	Ceramic 0.01μF
C502	1	1	1	1	EA10701630	Elect 100μF 16V
C503	1	1	1	1	EX47300510	Elect 0.047μF 5.5V
C504	1	1	1	1	DD15220300	Ceramic 22pF ±5%
C505	1	1	1	1	DD15220300	Ceramic 22pF ±5%
C506	1	1	1	1	DK18103310	Ceramic 0.01μF
C507	1	1	1	1	DK18103310	Ceramic 0.01μF
C508	1	1	1	1	DF15683310	Film 0.068μF ±5%
C509	1	1	1	1	EA22505030	Elect 2.2μF 50V
C510	1	1	1	1	DK18103310	Ceramic 0.01μF
⚠C801	1	1	1	1	DK18472560	Ceramic 4700pF
C802	1	1	1	1	EA47703570	Elect 470μF 35V
C803	1	1	1	1	EA10603530	Elect 10μF 35V
C804	1	1	1	1	EA10603530	Elect 10μF 35V
C805	1	1	1	1	EA10602530	Elect 10μF 25V
C806	1	1	1	1	EA10602530	Elect 10μF 25V
C807	1	1	1	1	EA10405030	Elect 0.1μF 50V
C808	1	1	1	1	EA10405030	Elect 0.1μF 50V
C809		1			EA10602530	Elect 10μF 25V(ST333L)
						P100-RESISTORS (All Resistors are ±5% & ¼W)
RA01	1	1	1	1	GD05332140	3.3KΩ
RA02	1	1	1	1	GD05474140	470KΩ
RA03	1	1	1	1	GD05470140	47Ω
RA04	1	1	1	1	GD05684140	680KΩ
RA05	1	1	1	1	GD05102140	1KΩ
RA06	1	1	1	1	GD05102140	1KΩ
RA07	1	1	1	1	GD05473140	47KΩ
RA08	1	1	1	1	GD05333140	33KΩ
RA09		1			GD05473140	47KΩ (ST333L)
RA10		1			GD05473140	47KΩ (ST333L)
RA11		1			GD05473140	47KΩ (ST333L)
RA12		1			GD05473140	47KΩ (ST333L)
RA13		1			GD05473140	47KΩ (ST333L)
RA14		1			GD05473140	47KΩ (ST333L)
RA15		1			GD05473140	47KΩ (ST333L)
RA16		1			GD05103140	10KΩ (ST333L)
RA17		1			GD05681140	680Ω (ST333L)
RA18	1	1	1	1	GD05681140	680Ω
R201	1	1	1	1	GD05101140	100Ω
R202	1	1	1	1	GD05181140	180Ω
R203	1	1	1	1	GD05331140	330Ω
R204	1	1	1	1	GD05152140	1.5KΩ
R205	1	1	1	1	GD05102140	1KΩ
R206	1	1	1	1	GD05331140	330Ω
R207	1	1	1	1	GD05473140	47KΩ
R208	1	1	1	1	GD05471140	470Ω
R209	1	1	1	1	GD05472140	4.7KΩ
R210	1	1	1	1	GD05272140	2.7KΩ
R211	1	1	1	1	GD05473140	47KΩ
R212	1	1	1	1	GD05103140	10KΩ
R213	1	1	1	1	RA05020800	5KΩ, Trimming
R214	1	1	1	1	GD05103140	10KΩ
R215	1	1	1	1	GD05103140	10KΩ
R216	1	1	1	1	GD05473140	47KΩ
R217	1	1	1	1	GD05473140	47KΩ
R218	1	1	1	1	GD05473140	47KΩ
R219	1	1	1	1	GD05473140	47KΩ
R220	1	1	1	1	GD05681140	680Ω
R221	1	1	1	1	GD05473140	47KΩ
R222	1	1	1	1	RA01040800	100KΩ, Trimming

- (U):for U.S.A.
- (N):for Europe
- (A):for Australia
- (F):for Japan

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
R301	1	1	1	1	GD05473140	47KΩ
R302	1	1	1	1	GD05153140	15KΩ
R303	1	1	1	1	GD05153140	15KΩ
R304	1	1	1	1	RA05020800	5KΩ, Trimming
R305	1	1	1	1	GD05102140	1KΩ
R306	1	1	1	1	GD05472140	4.7KΩ
R307	1	1	1	1	GD05153140	15KΩ
R308	1	1	1	1	GD05473140	47KΩ
R309	1	1	1	1	GD05181140	180Ω
R310	1	1	1	1	RA05040800	500KΩ, Trimming
R311	1	1	1	1	GD05223140	22KΩ
R312	1	1	1	1	GD05223140	22KΩ
R313	1	1	1	1	GD05473140	47KΩ
R314	1	1	1	1	GD05473140	47KΩ
R315	1	1	1	1	GD05332140	3.3KΩ
R316	1	1	1	1	GD05332140	3.3KΩ
R317	1	1	1	1	GD05473140	47KΩ
R318	1	1	1	1	GD05473140	47KΩ
R319	1	1	1	1	GD05103140	10KΩ
R320	1	1	1	1	GD05473140	47KΩ
R321	1	1	1	1	GD05473140	47KΩ
R322	1	1	1	1	GD05102140	1KΩ
R323	1	1	1	1	GD05473140	47KΩ
R324	1	1	1	1	GD05473140	47KΩ
R510	1	1	1	1	GD05473140	47KΩ
R502	1	1	1	1	GD05473140	47KΩ
R503	1	1	1	1	GD05573140	47KΩ
R504	1	1	1	1	GD05473140	47KΩ
R505	1	1	1	1	GD05473140	47KΩ
R506	1	1	1	1	GD05473140	47KΩ
R507	1	1	1	1	GD05473140	47KΩ
R508	1	1	1	1	GD05153140	15KΩ
R509	1	1	1	1	GD05473140	47KΩ
R510	1	1	1	1	GD05473140	47KΩ
R511	1	1	1	1	GD05471140	470Ω
R512	1	1	1	1	GD05473140	47KΩ
R513	1	1	1	1	GD05101140	100Ω
R514	1	1	1	1	GD05474140	470KΩ
R515	1	1	1	1	GD05470140	47Ω
R516	1	1	1	1	GD05473140	47KΩ
R517	1	1	1	1	GD05473140	47KΩ
R518	1	1	1	1	GD05473140	47KΩ
R519	1	1	1	1	GD05473140	47KΩ
R520	1	1	1	1	GD05271140	270Ω
R521	1	1	1	1	GD05271140	270Ω
R522	1	1	1	1	GD05473140	47KΩ
R523	1	1	1	1	GD05103140	10KΩ
R524	1	1	1	1	GD05103140	10KΩ
R525	1	1	1	1	GD05473140	47KΩ
R526	1	1	1	1	GD05102140	1KΩ
R527	1	1	1	1	GD05102140	1KΩ
R528	1	1	1	1	GD05103140	10KΩ
R529	1	1	1	1	GD05102140	1KΩ
⚠R801	1	1	1	1	GG05150120	15Ω ½W (ST333)
⚠R801		1			GG05270120	27Ω ½W (ST333L)
⚠R802	1	1	1	1	GA05151010	150Ω 1W (ST333)
⚠R802		1			GA05081010	180Ω 1W (ST333L)
R803	1	1	1	1	GD05473140	47KΩ

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
R804	1	1	1	1	GD05473140	47KΩ
R805	1	1	1	1	GD05473140	47KΩ
R806	1	1	1	1	GD05473140	47KΩ
R807	1	1	1	1	GD05473140	47KΩ
R808		1			GD05473140	47KΩ (ST333L)
R809		1			GD05473140	47KΩ (ST333L)
R810	1				RC10225920	2.2MΩ ±10% ½W
R811		1			GA05271020	270Ω 2W (ST333L)
R812	1	1	1	1	GD05473140	47KΩ
						P100-SEMICONDUCTORS
D001	1	1	1	1	HI11801080	L.E.D., Frequency Display
DA01	1	1	1	1	HD40003420	Varicap KV1236Z
DA02		1			HD20015030	Diode DS135D (ST333L)
DA03		1			HD20015030	Diode DS135D (ST333L)
DA04	1	1	1	1	HD20001000	Diode 1S1555
DA05		1			HD20001000	Diode 1S1555 (ST333L)
DA06		1			HD20001000	Diode 1S1555 (ST333L)
D201	1	1	1	1	HV00003120	Varistor MV-13
D202	1	1	1	1	HD10003020	Diode 2QA90
D301	1	1	1	1	HD20001000	Diode 1S1555
D302	1	1	1	1	HD20001000	Diode 1S1555
D501	1	1	1	1	HD20001000	Diode 1S1555
D502	1	1	1	1	HD20001000	Diode 1S1555
D503	1	1	1	1	HD20001000	Diode 1S1555
D504	1	1	1	1	HD20001000	Diode 1S1555
D505	1	1	1	1	HD20001000	Diode 1S1555
D506	1	1	1	1	HD20001000	Diode 1S1555
D507	1	1	1	1	HD20001000	Diode 1S1555
D508	1	1	1	1	HD20001000	Diode 1S1555
D509	1	1	1	1	HD20001000	Diode 1S1555
D510	1	1	1	1	HD20001000	Diode 1S1555
D511		1			HD20001000	Diode 1S1555(ST333L)
D511			1		HD20001000	Diode 1S1555
D512			1		HD20001000	Diode 1S1555
D513		1			HD20001000	Diode 1S1555(ST333L)
D514		1			HD20001000	Diode 1S1555(ST333L)
D515	1	1	1		HD20001000	Diode 1S1555
⚠D801	1	1	1	1	HD20015030	Diode DS135D
⚠D802	1	1	1	1	HD20015030	Diode DS135D
⚠D803	1	1	1	1	HD20015030	Diode DS135D
⚠D804	1	1	1	1	HD20015030	Diode DS135D
D805	1	1	1	1	HD20001000	Diode 1S1555
D806	1	1	1	1	HD20001000	Diode 1S1555
D807		1			HD20001000	Diode 1S1555(ST333L)
QA01	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
QA02	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
QA03		1			HT111752D0	Transistor 2SC2785(EF,FF) (ST333L)
QA04		1			HT327852D2	Transistor 2SC2785(EF,FF) (ST333L)
QA05		1			HT408631B0	Transistor 2SD863(E) (ST333L)
QA06		1			HT327852D0	Transistor 2SC2785(EF,FF) (ST333L)
QA07		1			HT408631B0	Transistor 2SD863(E) (ST333L)
Q201	1	1	1	1	HC10006020	IC AN278
Q202	1	1	1	1	HC10035020	IC AN7273
Q203	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q204	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q205	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q206	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q207	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q208	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q209	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)

- (U):for U.S.A.
- (N):for Europe
- (A):for Australia
- (F):for Japan

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
Q301	1	1	1	1	HC10046020	IC AN7470
Q302	1	1	1	1	HT111752D0	Transistor 2SA1175(EF,FF)
Q303	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q304	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q305	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q306	1	1	1	1	HT111752D0	Transistor 2SA1175(EF,FF)
Q501	1	1	1	1	HC10061060	IC μPD1704C-544
Q502	1	1	1	1	HC10030060	IC μPB553AC
Q503	1	1	1	1	HC10069060	IC μPD6322C
Q504	1	1	1	1	HC409400B0	IC μPD4094BC
Q505	1	1	1	1	HC10040010	IC HD74LS42P
Q506	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q507	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q508	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q509	1	1	1		HT111752D0	Transistor 2SA1175(EF,FF)
Q510	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q511	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q512	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q513	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q514	1	1	1	1	HT111752D0	Transistor 2SA1175(EF,FF)
Q515	1	1	1	1	HT111752D0	Transistor 2SA1175(EF,FF)
Q516	1	1	1	1	HF200300B0	F.E.T. 2SK30A(Y1)
Q517	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q518	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
⚠Q801	1	1	1	1	HC10077030	IC L78M15
⚠Q802	1	1	1	1	HC10107030	IC L78N06
Q803	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q804	1	1	1	1	HT327852D0	Transistor 2SC2785(EF,FF)
Q805		1			HT111752D0	Transistor 2SA1175(EF,FF)
						P100-MISCELLANEOUS
FA01	1	1	1	1	FF10045310	Ceramic Filter SFP450H
F201	1			1	FF11070590	Ceramic Filter SFE10.7MS2G
F201		1	1		FF11070570	Ceramic Filter SFE10.7MS3G
F202	1			1	FF11070530	Ceramic Filter SFE10.7MD1
F202		1	1		FF11070570	Ceramic Filter SFE10.7MS3G
LA01	1	1	1	1	LA10295110	Ant. Coil, AM(MW)
LA02		1			LA10295120	Ant. Coil, LW (ST333L)
LA03	1	1	1	1	LO10013340	OSC Coil, AM(MW)
LA04		1			LO10013350	OSC Coil, LW (ST333L)
LA05	1	1	1	1	LI10013260	I.F.T. Coil, AM
L201	1	1	1	1	LI20029010	I.F.T. Coil, FM
L202		1	1		LS10295020	M.P.X. Coil
X501	1	1	1	1	XB108001L2	Crystal, 4.5MHz
SA01		1			SZ06240010	Solenoid Switch, MW-LW
						PC00-ANTENNA TERMINAL CIRCUIT BOARD
PC00	1	1	1	1	YK429H1660	P.W.Board, Antenna Terminal
	1	1	1		ZZ429H1660	P.W.Board Assembly
JC01	1	1	1	1	YT03040240	Terminal, Antenna
WC01	1	1	1	1	YU04120260	Jumper Lead, (4P)

- (U):for U.S.A.
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- (A):for Australia
- (F):for Japan

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
						PS00-PRESET KEY SW. CIRCUIT BOARD
PS00	1	1	1	1	YK429H1620	P.W. Borad, Preset Key SW.
	1	1	1		ZZ429H1620	P.W. Board Assembly
						PS00-RESISTORS
RS01	1	1	1	1	GD05102140	1KΩ ±5% ¼W
RS02	1	1	1	1	GD05391140	390Ω ±5% ¼W
RS03	1	1	1	1	GD05221140	220Ω ±5% ¼W
						PS00-SEMICONDUCTORS
DS01	1	1	1	1	HI10043020	L.E.D. LN210RP, Memory
DS02	1	1	1	1	HI10044020	L.E.D. LN310GP, FM
DS03		1			HI10045020	L.E.D. LN410YP,MW(ST330L)
DS04	1	1	1	1	HI10045020	L.E.D. LN410YP, AM
DS05	1	1	1	1	HI10043020	L.E.D. LN210RP, Preset 1
DS06	1	1	1	1	HI10043020	L.E.D. LN210RP, Preset 2
DS07	1	1	1	1	HI10043020	L.E.D. LN210RP, Preset 3
DS08	1	1	1	1	HI10043020	L.E.D. LN210RP, Preset 4
DS09	1	1	1	1	HI10043020	L.E.D. LN210RP, Preset 5
DS10	1	1	1	1	HI10043020	L.E.D. LN210RP, Preset 6
DS11	1	1	1	1	HI10043020	L.E.D. LN210RP, Preset 7
DS12	1	1	1	1	HI10043020	L.E.D. LN210RP, Preset 8
DS13	1	1	1	1	HI10043020	L.E.D. LN210RP, Stereo
DS14	1	1	1	1	HI10043020	L.E.D. LN210RP, Signal 1
DS15	1	1	1	1	HI10043020	L.E.D. LN210RP, Signal 2
DS16	1	1	1	1	HI10043020	L.E.D. LN210RP, Signal 3
						PS00-MISCELLANOUS
SS01	1	1	1	1	SP01010570	Push Switch, Memory
SS02	1	1	1	1	SP01010570	Push Switch, Preset 1
SS03	1	1	1	1	SP01010570	Push Switch, Preset 2
SS04	1	1	1	1	SP01010570	Push Switch, Preset 3
SS05	1	1	1	1	SP01010570	Push Switch, Preset 4
SS06	1	1	1	1	SP01010570	Push Switch, Preset 5
SS07	1	1	1	1	SP01010570	Push Switch, Preset 6
SS08	1	1	1	1	SP01010570	Push Switch, Preset 7
SS09	1	1	1	1	SP01010570	Push Switch, Preset 8
SS10	1	1	1	1	SP01010570	Push Switch, FM
SS11		1			SP01010570	Push Switch, MW (ST333L)
SS12	1	1	1	1	SP01010570	Push Switch, AM
SS13		1			SP01010570	Push Switch, LW (ST333L)

- (U):for U.S.A.
- (N):for Europe
- (A):for Australia
- (F):for Japan

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
						PT00-UP/DOWN KEY SW. CIRCUIT BOARD
PT00	1	1	1	1	YK429H1630	P.W.Board,Up/Down Key SW.
	1	1	1		ZZ429H1630	P.W.Board Assembly
						PT00-RESISTORS
RT01	1	1	1	1	GD05271150	270Ω ±5% ¼W
RT02	1	1	1	1	GD05102140	1KΩ ±5% ¼W
						PT00-SEMICONDUCTORS
DT01	1	1	1	1	HI10037020	L.E.D. LN322GP
DT02	1	1	1	1	HI10025020	L.E.D. LN222RP
						PT00-MISCELLANEOUS
ST01	1	1	1	1	SP01010570	Push Switch, Rec
ST02	1	1	1	1	SP01010570	Push Switch, Rec Monitor
ST03	1	1	1	1	SP01010570	Push Switch, FM Mode
ST04	1	1	1	1	SP01010570	Push Switch, Up
ST05	1	1	1	1	SP01010570	Push Switch, Down
WT01	1	1	1	1	YU07080260	Jumper Lead, (7P)
WT02	1	1	1	1	YU03080260	Jumper Lead, (3P)

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

- (U):for U.S.A.
- (N):for Europe
- (A):for Australia
- (F):for Japan

REF. DESIG.	Q'TY U	N	A	F	PART NO.	DESCRIPTION
						PU00-POWER SWITCH CIRCUIT BOARD
PU00	1	1	1	1	YK429H1640	P.W. Board, Power Switch
	1	1	1		ZZ429H1640	P.W. Board Assembly
SU01	1	1	1	1	SP02010960	Push Switch, Power/Stundby
WU01	1	1	1	1	YU05120260	Jumper Lead, (5P)
						PV00-INPUT/OUTPUT TERMINAL CIRCUIT BOARD
PV00	1	1	1	1	YK429H1650	P.W. Board, Input/Output Terminal
	1				ZZ429H1650	P.W. Board Assembly
		1	1		ZZ429H8650	P.W. Board Assembly
JV01	1	1	1	1	YT02020330	Terminal, Tuner OUT
JV02	1	1	1	1	YT02020350	Terminal, Easy Operation
JV03	1	1	1	1	YT02020340	Terminal, Remote Control
SV01	1	1	1		SS02020760	Slide Switch, Scan Step
WV01	1	1	1		YU06120260	Jumper Lead, (6P)
WV01				1	YU05120260	Jumper Lead, (5P)

NOTE ON SAFETY:
Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

16. TECHNICAL SPECIFICATIONS

FM TUNER SECTION

Frequency Range		87.5 ~ 108 MHz
Usable Sensitivity		
Mono	S/N 26 dB, 300 ohms	1.2 μV
Stereo	S/N 46 dB, 300 ohms	40 μV
Alternate Channel Selectivity 98 MHz		63 dB
Image Response Rejection		48 dB
IF Rejection		70 dB
Spurious Response Rejection		75 dB
AM Suppression		55 dB
Signal-to-Noise Ratio		
Unweighted	Mono	70 dB
	Stereo	63 dB
Weighted	Mono	76 dB
	Stereo	68 dB
Pilot Signal & Subcarrier Rejection		
19 kHz		35 dB
38 kHz		45 dB
Total Harmonic Distortion		
Mono		0.1%
Stereo		0.2%
Frequency Response		
30 Hz ~ 15 kHz		+0.5 dB, −1.5 dB
Separation		
Stereo		45 dB
Channel Balance		0.2 dB

MW TUNER SECTION

Frequency Range	522 ~ 1611 kHz
Usable Sensitivity 20 dB S/N 30% Mod., 999 kHz	500 μV/m
Selectivity 999 kHz, ±9 kHz	60 dB
Image Rejection, 999 kHz	40 dB
IF Rejection, 999 kHz	55 dB
Signal-to-Noise Ratio, 999 kHz	43 dB
Total Harmonic Distortion, 999 kHz	1.2%

LW TUNER SECTION

Frequency Range	153 ~ 353 kHz
Usable Sensitivity 20 dB S/N 30% Mod., 254 kHz	800 μV/m
Image Rejection, 254 kHz	50 dB
IF Rejection, 254 kHz	50 dB
Signal-to-Noise Ratio, 254 kHz	43 dB

GENERAL

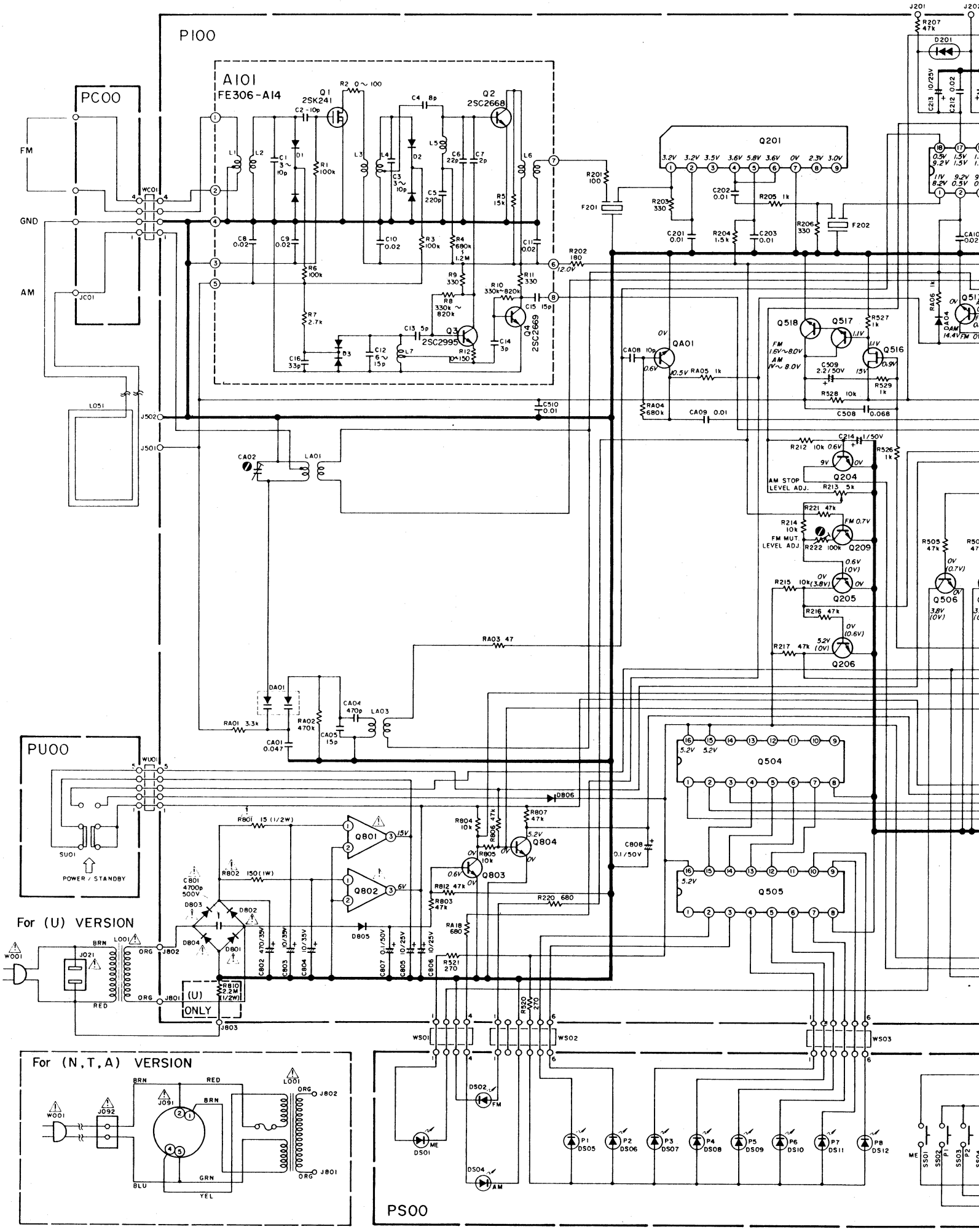
Power Requirements (ST333)	110/120/220/240V AC, 50/60 Hz
Power Consumption (ST333L)	220 ~ 240V AC, 50/60 Hz
Power Consumption	8W
Dimensions	
Panel Width	320 mm
Panel Height	43 mm
Depth	260 mm
Weight	
Unit Alone	1.9 kg

Specifications and appearance are subject to change for modification without notice.

MEMORANDUM

17. SCHEMATIC DIAGRAM

Q201 AN278 HC10006020	Q301 AN7470 HC10046020	Q502 μPB553AC HC10030060	Q504 μPD4094BC ETC HC409400B0	Q516 2SK30A YI HF200300B0	Q802 L78N06 HC10107030	Q203 ~ Q209, Q303 ~ Q305 Q506 ~ Q508, Q510 ~ Q513 Q517 ~ Q519, Q803, Q804, QA01 QA02 2SC2785 EF or FF HT327852D0	Q302, Q306, Q509 Q514, Q515 2SA1175 EF or FF HT1117520
Q202 AN7273 HC10035020	Q501 μPD1704C-544 HC10061060	Q503 μPD6322C HC10069060	Q505 HD74LS42P HC10040010	Q801 L78M15 HC10077030			



NOTE ON SAFETY :
Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

Model ST333

Q306, Q509
Q515
'5 EF or FF
52D0

D201
MV-13
HV00003120

D202
20A90
HD10003020

DA01
KV1236Z
HD40003420

D801 ~ D804
HD20015030
DS135 D

D805, D806, D301 ~ D303
D501 ~ D510, D515
DA04
IS1555, IS2473C, ETC
HD20001000

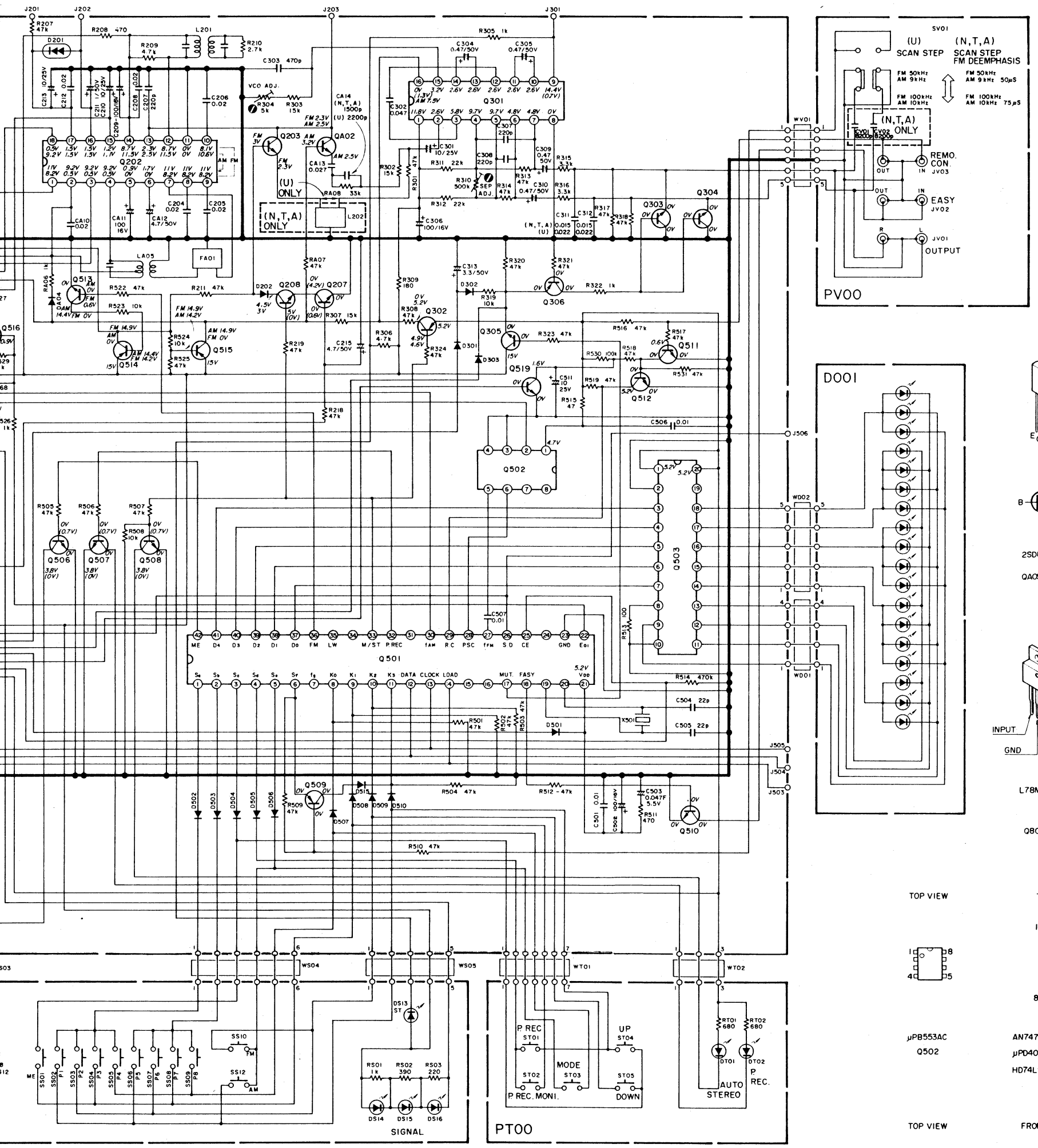
DS01, DS05 ~ DS16
LN210RP (RED)
HI10043020

DT01, DT02
LN222RP (RED)
HI10025020

D001
SEL-8834
HI11801080

DS02
LN310GP (GREEN)
HI10044020

DS04
LN410YP (AMBER)
HI10045020



2SC2785 (EF or FF)
Q203 ~ Q209
Q303 ~ Q305
Q506 ~ Q508
Q510 ~ Q513
Q517, Q518
Q803, Q804
QA01, QA02

QA04, QA06, QA08
(L) ONLY

2SA1175 (EF or FF)
Q302, Q306
Q509, Q514, Q515

Q805, QA03
(L) ONLY

2SD863E
QA05, QA07

2SK30A
Q516

L78M05
Q801

L78N06
Q802

TOP VIEW
μPB553AC
Q502

TOP VIEW
AN7470 Q301
μPD4094BC Q504
HD74LS42P Q505

TOP VIEW
AN7237
Q202

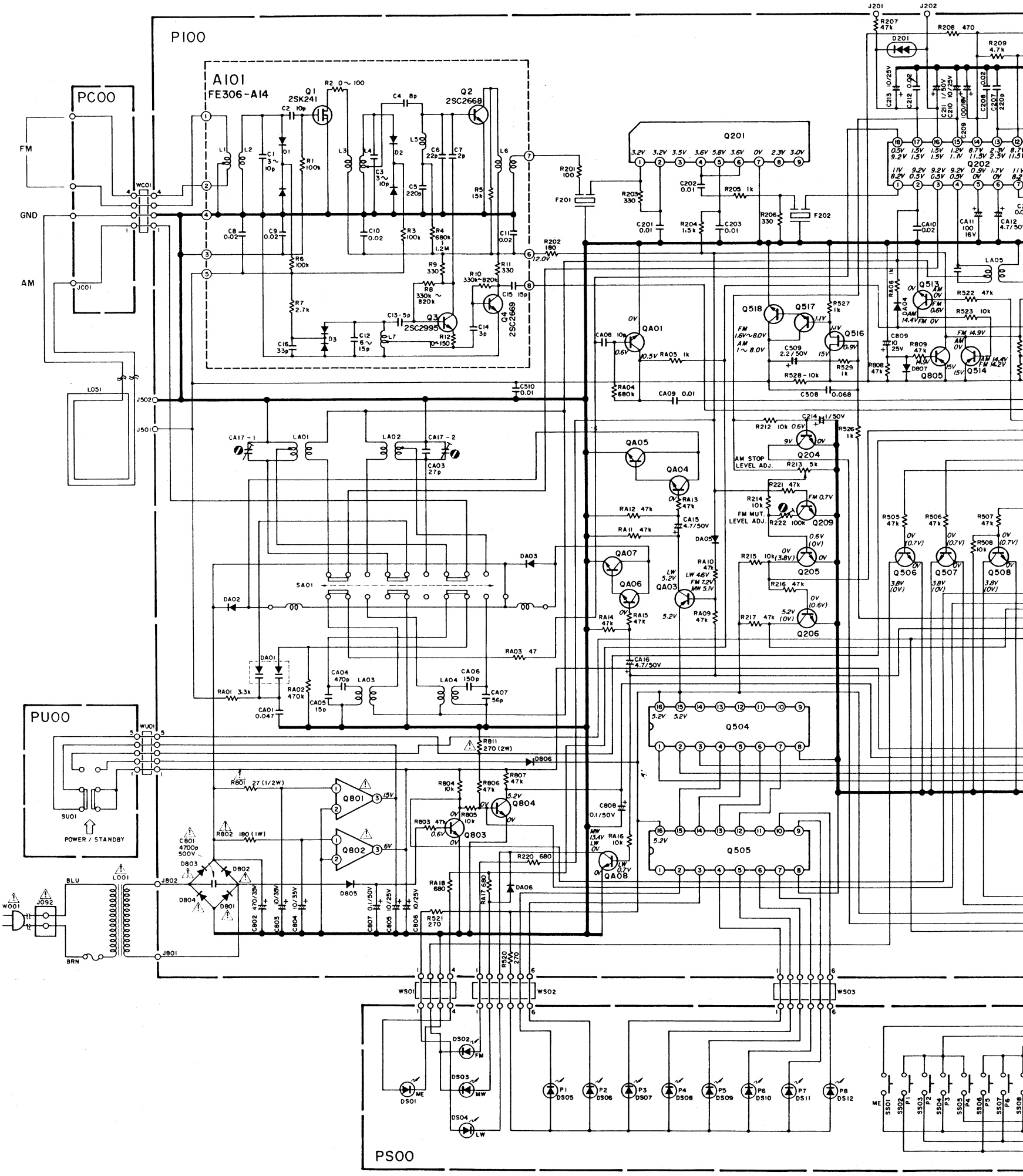
TOP VIEW
μPD6322C
Q503

FRONT VIEW
AN278
Q201

TOP VIEW
μPD1704C-554
Q501

Components and wiring are subject to change for modification without notice.

Q201 AN278 HC10006020	Q301 AN7470 HC10046020	Q502 μPB553AC HC10030060	Q504 μPD4094BC ETC HC409400B0	Q516 2SK30A YI HF200300B0	Q802 L78N06 HC10107030	Q203 ~ Q209, Q303 ~ Q305 Q506 ~ Q508, Q510 ~ Q513 Q517~Q519, Q803, Q804, QA01 QA02, QA04, QA06, QA08 2SC2785 EF or FF HT32785200	Q302, Q306, Q509 Q514, Q515, Q805, QA03 2SA1175 EF or FF HT1111752D0	D201 MV-13 HV00003120
Q202 AN7273 HC10035020	Q501 μPD1704C-544 HC10061060	Q503 μPD6322C HC10069060	Q505 HD74LS42P HC10040010	Q801 L78M15 HC10077030	QA05, QA07 2SD863E HT40863IB0			D202 20A90 HD10003020



NOTE ON SAFETY :

Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

Model ST333L

,Q509
Q805, QA03
or FF

D201
MV-13
HV00003120

D202
20A90
HD10003020

DA01
KV1236Z
HD40003420

D801 ~ D804, DA02, DA03
HD20015030
DS135 D

D805, D806, D301 ~ D303
D501 ~ D511, DA04 ~ DA06
D513, D514, D807
IS1555, IS2473C, ETC
HD20001000

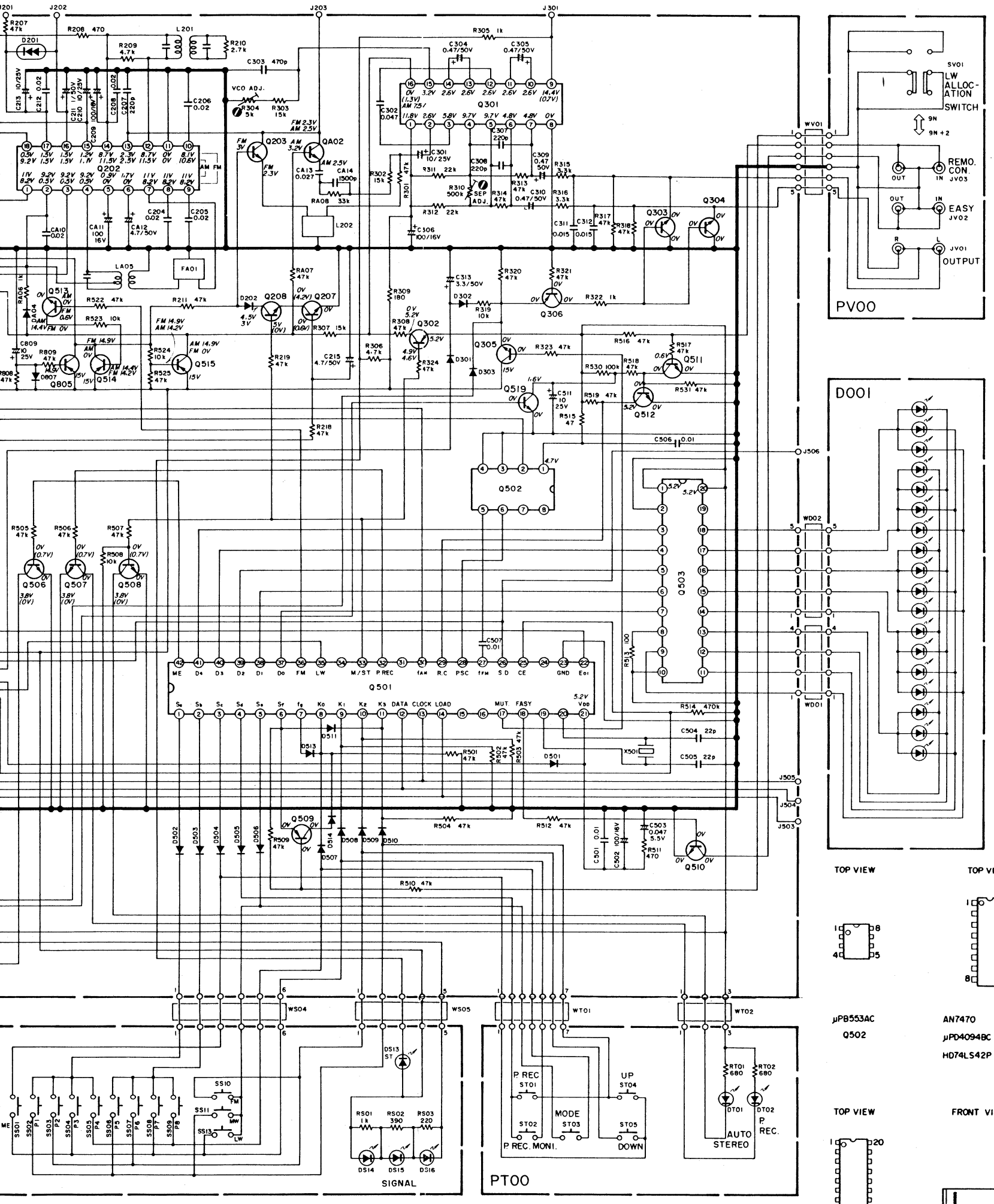
DS01, DS05 ~ DS16
LN210RP (RED)
HI10043020

DT01, DT02
LN222RP (RED)
HI10025020

D001
SEL-8834
HI11801080

DS02
LN310GP (GREEN)
HI10044020

DS03, DS04
LN410YP (AMBER)
HI10045020



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TOP VIEW
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μPD4094BC Q504
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TOP VIEW
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μPD6322C
Q503

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